northwest Clean Air agency

1600 South Second Street
Mount Vernon, WA 98273-5202
ph 360.428.1617
fax 360.428.1620
www.nwcleanair.org

Air Operating Permit
Excess Emissions Report
Form Part II

Name of Facility	Shell, Puget Sound Refinery	Reported by	Tim Figgie
Date of notification	Mar 4 & 6, 2014	Incident type: breakdown/ upset/startup or shutdown	Shutdown
Start Date	Mar 4, 2014	Start Time:	10:00 AM
End Date	Mar 6, 2014	End Time:	1:00 PM
Process unit or system(s): Flare			

Incident Description

On March 4, 2014, shutdown of the Northside process units (FCCU, Poly, Alky1&2, HTU3 and SRU4) began in preparation for a planned maintenance turnaround. Prior to the shutdown PSR engaged in a process safety and procedural review to ensure to the greatest extent practicable that abnormal conditions, and any resulting environmental impacts, would be averted.

However, during the shutdown process H2S readings above 162ppm 3-hour rolling average occurred in the flare. High H2S readings occurred on March 4th when the flow to the flare exceeded the Flare Gas Recovery (FGR) system capacity. The combined base load flare flow and instantaneous pressure spikes during depressuring of the FCCU exceeded the available capacity of the FGR system. This allowed sour gas to flow to the flare for a short period of time.

High H2S readings also occurred on March 6th when a high volume of liquids entered the suction line to the FGR compressors causing reduced FGR capacity and high pressure in the flare header. This caused high amps and vibration on the FGR compressors, which required a manual shutdown of the FGR compressors to remove the condensed liquids. The primary flow contributor during this event was the Alky2 shutdown.

H2S readings above 162ppm 3-hour rolling average occurred as follows:

- March 4: 10 and 11 AM
- March 6: 12 and 1 PM

Immediate steps taken to limit the duration and/or quantity of excess emissions:

Operations immediately began troubleshooting the problem.

Applicable air operating permit term(s): permit terms are not yet defined

Estimated Excess Emissions:	Pollutant(s):	Pounds (Estimate):
Based on online H2S CEMS and fuel gas flow meters	SO2	30

The incident was the result of the following (check all that apply):

- ☐ Scheduled equipment startup
- ☒ Scheduled equipment shutdown
- ☐ Poor or inadequate design
- ☐ Careless, poor, or inadequate operation
- ☐ Poor or inadequate maintenance
- ☐ A reasonably preventable condition

Did the facility receive any complaints from the public?

- ☒ No
- ☐ Yes (provide details below)

Did the incident result in the violation of an ambient air quality standard

- ☒ No
- ☐ Yes (provide details below)

Root and other contributing causes of incident:

The root cause of this event was high flow of hydrocarbon to the flare FGR system during shutdown of the Northside process units in preparation for a planned maintenance turnaround.

The root cause of the incident was:

(The retention of records of all required monitoring data and support information shall be kept for a period of five years from the date of the report as per the WAC regulation (173-401-615))

- ☐ Identified for the first time
- ☒ Identified as a recurrence (explain previous incident(s) below – provide dates)

Other incidences of hydrocarbons condensing in the FGR have occurred. See reports dated Jan 9 and Feb 6 of 2014.

Are the emissions from the incident exempted by the NSPS or NESHAP "malfunction" definitions below?

- ☒ No
- ☐ Yes (describe below)

Definition of NSPS "Malfunction": Any sudden, infrequent, and not reasonably preventable failure of air pollution control equipment, process equipment, or failure of a process to operate in a normal or usual manner. Failures that are caused in part by poor maintenance or careless operation are not malfunctions. 40 CFR 60.2

Definition of NESHAP "Malfunction": Any sudden, infrequent, and not reasonably preventable failure of air pollution control and monitoring equipment, process equipment, or a process to operate in a normal or usual manner which causes, or has the potential to cause, the emission limitations in an applicable standard to be exceeded. Failures that are caused in part by poor maintenance or careless operation are not malfunctions. 40 CFR 63.2

Analyses of measures available to reduce likelihood of recurrence (evaluate possible design, operational, and maintenance changes; discuss alternatives, probable effectiveness, and cost; determine if an outside consultant should be retained to assist with analyses):

To prevent a reoccurrence of this event, PSR has checked the flare line for low points that may accumulate liquids. PSR has also checked PRV's on the ALKY2 to check for premature relief. Alky2 PRV's did not relieve early. PSR is also testing the plant amine system to allow for a higher amine temperature that would lessen hydrocarbon condensation. PSR is also evaluating engineering solutions to allow the system to better handle significantly abnormal conditions.

Description of corrective action to be taken (include commencement and completion dates):

See above

If correction not required, explain basis for conclusion:

See above

Attach Reports, Reference Documents, and Other Backup Material as Necessary. This report satisfies the requirements of both NWCAA regulation 340, 341, 342 and the WAC regulation (173-400-107).

Is the investigation continuing? ☒No ☐Yes
Is the source requesting additional time for completion of the report? ☒No ☐Yes

Based upon information and belief formed after reasonable inquiry, I certify that the statements and information in this document and all referenced documents and attachments are true, accurate and complete.

Prepared By: _ Michael Moore Date: ___ Apr 22, 2014

Responsible Official or Designee: Thomas J Ryan Date: 4/28/14